



(11) **EP 1 705 933 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
04.03.2009 Bulletin 2009/10

(51) Int Cl.:
H04W 4/14 ^(2009.01)

(21) Application number: **06005738.7**

(22) Date of filing: **21.03.2006**

(54) **Method and apparatus for delayed transmission of SMS messages**

Verfahren und Vorrichtung für verzögertes Übertragen von SMS Nachrichten

Procédé et appareil pour la transmission retardée de messages SMS

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **22.03.2005 KR 2005023810**

(43) Date of publication of application:
27.09.2006 Bulletin 2006/39

(73) Proprietor: **LG Electronics Inc.
Yongdungpo-Gu
Seoul 150-010 (KR)**

(72) Inventor: **Kim, Hyun-Sung
Bucheon
Gyeonggi-Do (KR)**

(74) Representative: **Urner, Peter
TER MEER STEINMEISTER & PARTNER GbR
Patentanwälte
Mauerkircherstrasse 45
81679 München (DE)**

(56) References cited:
**AU-B- 732 382 AU-B- 753 358
US-A1- 2005 055 408**

- "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Technical realization of Short Message Service (SMS) (3GPP TS 23.040 version 6.5.0 Release 6); ETSI TS 123 040" ETSI STANDARDS, EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE, SOPHIA-ANTIPO, FR, vol. 3-T2, no. V650, September 2004 (2004-09), XP014027463 ISSN: 0000-0001

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 705 933 B1

Description**FIELD OF THE INVENTION**

[0001] The present invention relates to a method for delayed transmission of a SMS message, and more particularly to a method for delayed transmission of a SMS message by a mobile communication terminal over a mobile communication network, and to a corresponding system.

BACKGROUND

[0002] Wireless mobile communication service providers support various mobile communication services including moving image service, voice service, and text messaging service. In text messaging service, a short messaging service (SMS) for transmission of a text message can be used to provide news, weather and stock information.

[0003] The SMS provides a bi-directional text messaging service for transmitting and receiving a short text message, even when there is a call in progress between a receiving mobile terminal and another party. The short text message can be transmitted to another party by designating a delayed transmission time using the features available on a sender's terminal.

[0004] FIG. 1 is a flowchart of a method for delayed transmission of a SMS message in accordance with the related art. As shown, when the mobile terminal is in a primary mode (S10), a user selects a transmission mode by interacting with the mobile terminal's user interface (S20). The user then inputs contact information (e.g., a recipient's phone number) and a text message (S30).

[0005] The user may set a delayed transmission time (S40). Once the message input is completed (S50), the message is stored in a memory of the mobile terminal (S60). Then, the mobile terminal's microprocessor compares the current time with the delayed transmission time (S70). Upon expiration of the delayed transmission time, an alarm is generated (S80) and the terminal transmits the corresponding message stored in the memory to the recipient (S90).

[0006] In the above-described conventional delayed transmission method, when the terminal is turned off or positioned in a region where mobile communication service is unavailable, the stored message cannot be transmitted. This problem arises because the message is stored locally in the terminal's memory, so if a communication connection is not available the terminal cannot send the stored message.

[0007] Systems and methods are needed that can overcome the shortcomings of the related art system.

[0008] AU 753358 B2 describes a system and a message for a time defined delivery of SMS messages. It describes that a mobile subscriber can define a date and time of delivery of a SMS message, wherein the date and time delivery information is transported to the SMS service center together with a SMS message, where it can be stored until the requested time of delivery. When the requested time of delivery occurs the SMS message can be forwarded to the mobile subscriber.

[0009] AU 732382 B2 describes a radio communication system having a mobile station, which is adapted to transmit a signal including a SMS text message, wherein the signal includes a deferred delivery time at which the SMS text message is to be transmitted to an intended recipient. The radio communication system further includes a base station having a transceiver for transceiving said signal from the mobile station and forwarding said SMS message. The system further includes a network for receiving said SMS message from said base station, wherein the network includes a server center, which is storing the SMS and which is delivering the SMS message through said network to an intended recipient at said deferred delivery time.

SUMMARY OF THE INVENTION

[0010] The present invention provides an improved method and system for delayed transmission of a message over short messaging service (SMS) via a mobile terminal. Accordingly, instead of storing the SMS message in a memory of the mobile terminal, the SMS message and the transmission time are transmitted to a message center so that the message delivery can be accomplished by the message center at the proper time regardless of the power or reception state of the mobile terminal transmitting the message.

This object is solved by the features of the independent claims.

[0011] In one embodiment, the message content is transmitted from the message center to the recipient, after a predefined time specified by the timing information expires. The transmission information and the message content are encapsulated into a user data header (UDH) of a short messaging service (SMS) message, for example. The encapsulation of the transmission information and the message content is represented by setting a parameter in a transfer protocol data unit (TPDU) utilized for transmitting a SMS message. The parameter is a transfer protocol user data header indicator (TP-UDHI) of the TPDU, and an information element identifier (IEI) field of the TPDU comprises the timing information.

[0012] In one embodiment, a compressed short message (SM) field of the TPDU comprises the message content in compressed form. An information element identifier data length (IEIDL) field of the TPDU comprises information about length of the transmission information. The timing information comprises at least one of a relative transmission time and an absolute transmission time.

[0013] The relative transmission time indicates a time delay after which the message content is to be transmitted from the remote message center to the recipient, and the absolute transmission time indicates a specific time at which the message content is to be transmitted from the remote message center to the recipient.

[0014] The transmission information may further comprise an identifier, wherein a first value for the identifier indicates that the timing information represents the absolute transmission time, and a second value for the identifier indicates that the timing information represents the relative transmission time.

[0015] The timing information comprises at least one of a relative transmission time and an absolute transmission time, wherein the relative transmission time indicates a time delay after which the message content is to be transmitted from the remote message center to the recipient, and the absolute transmission time indicates a specific time at which the message content is to be transmitted from the remote message center to the recipient.

[0016] The transmission information further comprises an identifier, wherein a first value for the identifier indicates that the timing information represents the absolute transmission time, and a second value for the identifier indicates that the timing information represents the relative transmission time.

[0017] The message is of a type selected from the group consisting of a SMS message service message, a multimedia messaging service (MMS) message, and a long messaging service (LMS) message. The transmission information is inserted into at least one reserved information element identifier (IEI) value among IEI values of the user data header.

[0018] The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention, and together with the description serve to explain the principles of the invention.

[0020] FIG. 1 is a flowchart of a method for delayed transmission of a SMS message by a mobile terminal in accordance with the related art.

[0021] FIG. 2 is a block diagram schematically illustrating a mobile communication network environment comprising a SMS message service center (SMSC) in communication with a plurality of mobile terminals, in accordance with one embodiment.

[0022] FIG. 3 is a diagram illustrating an exemplary data format for a SMS data transfer protocol, in accordance with one embodiment.

[0023] FIG. 4 is a diagram illustrating an exemplary user data header (UDH) of an SMS message, in which transmission information and message context can be encapsulated, in accordance with one embodiment.

[0024] FIG. 5 is a flowchart of a method for delayed transmission of a SMS message by a mobile terminal, in accordance with one embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0025] In accordance with one embodiment, a message using the short messaging service (SMS) may be transmitted to a recipient at a specific time after the message is composed. That is, a user instead of sending an SMS message immediately after it is composed, can set a transmission time upon the expiration of which the message is to be transmitted to a recipient. In accordance with one aspect of the invention, the transmission of the message is managed by a message center.

[0026] To accomplish the above, the content of a SMS message and the respective transmission time is included in a data packet and are transmitted to a SMS message service center (SMSC). The information in the data packet is stored in a storage medium by the SMSC. Once the transmission time expires, the SMSC transmits the message to a recipient.

[0027] Referring to FIG. 2, in a preferred embodiment, a terminal 204 communicates with SMSC 200 over a mobile communication network 210. A user may interact with terminal 204 to compose a SMS message and to set a transmission time. The transmission time is the time when the user would like for the message to be transmitted to a recipient. The user may, for example, provide an offset or time delay from the time of composing the message to indicate the transmission time, or alternatively provide the preferred transmission time directly.

[0028] In accordance with one embodiment, the transmission time and the message content are encapsulated into a

user data header (UDH) of the SMS message and transmitted to the SMSC 200 over the SMS communication protocol. The SMSC 200 comprises a message transmission module 201 for receiving the SMS messages and analyzing the data included in the UDH. The SMSC 200 further comprises storage units 202 and 203. In a preferred embodiment, the content of the received SMS messages that are to be transmitted with a delay are stored in storage unit 203. SMS messages that are not to be delayed are stored in a buffer or a queue such as a storage unit 203.

[0029] In accordance with one aspect of the invention, SMS data is communicated between SMSC 200 and a mobile terminal 204 by way of a transfer protocol data unit (TPDU). In an exemplary embodiment, the mobile communication network 210 is developed according to the GSM communication standards (e.g., the 3rd Generation Partnership Project (3GPP)). The TPDU can be implemented as either an SMS-DELIVER type or an SMS-SUBMIT type. In an exemplary embodiment, on the transmitting end, a mobile terminal 204 converts a composed SMS message into an SMS-SUBMIT type TPDU. On the receiving end, the SMSC 200 converts the SMS-SUBMIT type TPDU into an SMS-DELIVER type TPDU, for example, before it is transmitted to the recipient.

[0030] Referring to FIG. 3, an exemplary data structure for a SMS-SUBMIT type TPDU is provided. In the TPDU, a flag can be set to indicate the presence of a UDH. In a preferred embodiment, a transfer protocol user data header indicator (TP-UDHI) parameter of the TPDU is set to accomplish this task. The TPDU comprises a transfer protocol user data (TP-UD) portion reserved for carrying animation, music, and text data. In one embodiment, when a TP-UDHI is set, it is an indication that TP-UD portion of the TPDU contains a UDH.

[0031] FIG. 4 is a detailed view of the UDH as included in the TP-UD according to 3GPP specification 23.040. In this exemplary embodiment, the information element identifier (IEI) field is used to store transmission timing information for a SMS message; and the compressed SM field is used for storing the content of the SMS message in compressed form. In a preferred embodiment, each field of the UDH has a value as defined in Table 1 below.

Table 1

VALUE (hex)	MEANING	Classification	Repeatability
0	Concatenated short messages, 8-bit reference number	SMS Control	No
1	Special SMS Message indication	SMS Control	Yes
2	Reserved	N/A	N/A
3	Value not used to avoid misinterpretation as <LF> character	N/A	N/A
4	Application port addressing scheme, 8 bit address	SMS Control	No
5	Application port addressing scheme, 16 bit address	SMS Control	No
6	SMSC Control Parameters	SMS Control	No
7	UDH Source Indicator	SMS Control	Yes
8	Concatenated short message, 16-bit reference number	SMS Control	No
9	Wireless Control Message Protocol	SMS Control	Note 3
0A	Text Formatting	EMS Control	Yes
0B	Predefined Sound	EMS Content	Yes
0C	User Defined Sound (iMelody max 128 bytes)	EMS Content	Yes
0D	Predefined Animation	EMS Content	Yes
0E	Large Animation (16*16 times 4 32*4 =128 bytes)	EMS Content	Yes
0F	Small Animation (8*8 times 4 = 8*4 =32 bytes)	EMS Content	Yes
10	Large Picture (32*32 = 12B bytes)	EMS Content	Yes
11	Small Picture (16*16 = 32 bytes)	EMS Content	Yes
12	Variable Picture	EMS Content	Yes
13	User prompt indicator	EMS Control	Yes
14	Extended Object	EMS Content	Yes
15	Reused Extended Object	EMS Control	Yes
16	Compression Control	EMS Control	No

EP 1 705 933 B1

(continued)

VALUE (hex)	MEANING	Classification	Repeatability
17	Object Distribution indicator	EMS Control	Yes
18	Standard WVG object	EMS Content	Yes
19	Character Size WVG object	EMS Content	Yes
1A	Extended Object Data Request Command	EMS Control	No
1B-1F	Reserved for future EMS features (see subclause 3.10)	N/A	N/A
20	RFC 822 E-Mail Header	SMS Control	No
21	Hyperlink format element	SMS Control	Yes
22	Reply Address Element	SMS Control	No
23 - 6F	Reserved for future use	N/A	N/A
70-7F	(U)SIM Toolkit Security Headers	SMS Control	Note 1
80-9F	SME to SME specific use	SMS Control	Note 2
A0 - BF	Reserved for future use	N/A	N/A
C0- DF	SC specific use	SMS Control	Note 2
E0- FF	Reserved for future use	N/A	N/A

[0032] In a preferred embodiment, a SMS message is tagged for delayed transmission by inserting the transmission information into the information element data (IED) field. For example, one of the reserved values 2, 1B-1F, 23-6F, A0-BF, or EO-FF can be used to tag the SMS message. The transmission information may comprise a transmission time for the SMS message in addition to an identifier for identifying whether the transmission time is an absolute time (e.g., March 26, 2006 at 10.00 AM) or a relative time (e.g., one hour later after the message is composed). The information element data length (IEDL) field contains information about the length of the IED.

[0033] In one embodiment, the transmission information may be inserted into the IEI fields (e.g., IEIa through IEIn). For example, let us assume that the current time is "00 seconds, 00 minutes, 14 hours, March 22, 2005" and that the transmission time of a SMS message is set by the user to "00 seconds, 00 minutes, 14 hours, March 23, 2005." In the above scenario, the following field values for the transmission information are respectively inserted into the IEI, IEIDL, and IED fields as provided in Table 2, below.

Field	Relative time (Hex)	Meaning	Absolute time (Hex)	Meaning
IEIa	0xA0	Reserved value of IEI values	0x0A	Reserved value of IEI values
IEIDLa	0x04	Length of IEDa	0x07	Length of IEDa
IEDa Octet 1	0x00	Relative time identifier	0x01	Absolute time identifier
Octet 2	0x02	Length of Octet 3,4	0x05	Transmission Reservation time/ Corresponding year
Octet 3	0x14	First two values from front direction of (14) relative time(1440 minutes)	0x02	Transmission time/ Corresponding month
Octet 4	0x40	Second two values from back direction of (14) relative of time(1440 minutes)	0x23	Transmission Reservation time/ Corresponding date

Table 2

Octet 5			0x14	Transmission Reservation time/ Corresponding hour
Octet 6			0x00	Transmission Reservation time/ Corresponding minute
Octet 7			0x00	Transmission Reservation time/ Corresponding second

[0034] Where the transmission time is set as a relative time, and the transmission time (e.g., 0xA0) is selected from the IEI values of Table 1, for example, the value '0xA0' is inserted into the IEIa field. The number of octets (e.g., 0x04) denote the length of IEDa and are inserted into IEIDLa, for example. A relative time identifying value (e.g., 0x00) is inserted into the first octet of the IEDa, for example, to identify that the transmission time is set as a relative time, rather than an absolute time.

[0035] A value corresponding to the number of octets (e.g., 0x02) representing the relative time value (e.g., 1440 minutes = one day) of the transmission time are inserted into the second octet, for example. And the relative time value (e.g., 1440 minutes) of the transmission time is inserted into the third and fourth octets respectively as the values '0x14' and '0x40', for example.

[0036] Where the transmission time is set as an absolute time, the value '0xA0' is inserted into the IEIa field, and the number of octets (e.g., 0x07) corresponding to the length of the IEDa is inserted into IEIDLa, for example. An absolute time identifier value (0x01) is inserted into the first octet of the IEDa to identify that the transmission time is set as an absolute time, for example. A value (e.g., 0x05) indicating the corresponding year (e.g., 2005) of the transmission time is inserted into the second octet, for example.

[0037] A value (e.g., 0x03) indicating the corresponding month (e.g., March) of the transmission time is inserted into the third octet, for example. A value (e.g., 0x23) indicating the corresponding date (e.g., 23) of the transmission time is inserted into the fourth octet, for example. A value (e.g., 0x14) indicating the corresponding hour (e.g., 14 hours) of the transmission time is inserted into the fifth octet, for example. A value (e.g., 0x00) indicating the corresponding minute (e.g., 00 minute) of the transmission time is inserted into the sixth octet, for example. And a value (e.g., 0x00) indicating the corresponding second (e.g., 00 seconds) of the transmission time is inserted into the seventh octet, for example.

[0038] FIG. 5 is a flowchart showing a method for delayed transmission of a SMS message from a mobile terminal according to one embodiment of the invention. This method is based on the functionalities of the SMSC 200, the mobile terminal 204, and the aforementioned implementation of the TPDU and the UDH. The method comprises transmitting a user-composed SMS message and transmission information from a terminal 204 to an SMSC 200 (S150), analyzing the transmission information at the SMSC 200 (S210), and transmitting the SMS message to a recipient at the designated transmission time (S270).

[0039] In one embodiment, a user employs a message composing function on a mobile terminal 204 to enter a recipient's contact information (e.g., phone number) and a SMS message (S 110). If the user wants to delay the transmission of the SMS message (S 120), the user sets a transmission time for the composed message by designating an absolute time or a relative time (S130). The mobile terminal 204 allocates a part of the TP-UD as the UDH and inserts the transmission information into the reserved IEI values within the UDH.

[0040] The mobile terminal 204 adds the user-composed SMS message in a field (e.g., compressed SM field) of the UDH in a compressed form, thereby creating an SMS-SUBMIT TPDU (S140). Subsequently, the mobile terminal 204 transmits the SMS-SUBMIT TPDU, including the SMS message content and the transmission information to the SMSC 200 (S150).

[0041] The SMSC 200 receives the transmitted SMS-SUBMIT TPDU. The SMSC's message transmission module 201 extracts the UDH from the SMS-SUBMIT TPDU to analyze the transmission information (S210). Then, it is determined if the SMS message is to be send with or without delay (S220). If no transmission time has been set for the SMS message, the SMS message is stored in the storage unit 203 to be transmitted without delay (S240). If the SMS message is one for which a transmission time has been set, the SMS message is stored in the SMSC's storage unit 202 temporarily to be transmitted with a delay (S230).

[0042] In accordance with one embodiment, it is then determined by the SMSC's analysis module 201 if the transmission time has expired (S250). If so, the SMSC 200 writes an SMS-DELIVER TPDU for the SMS message (S260) and transmits the SMS-DELIVER TPDU to the recipient (S270). If the SMS message has a set transmission time, the corresponding transmission information may be included in the SMS-DELIVER TPDU.

[0043] The present invention has been disclosed in detail as applicable to a method for delayed transmission of a SMS message in a GSM system and according to the corresponding 3GPP communication standards. It is noteworthy, however, that the present invention can be equally applied to delayed transmission of a message in other messaging systems (e.g., email, instant messaging, etc.) and according to other communication protocols (e.g., TDMA, CDMA, WCDMA, etc.).

[0044] Additionally, the present invention can be realized not only in a wireless network environment but also in a

wired network environment. Moreover, the present invention can be applied to not only a SMS message service (SMS), but also to a multimedia messaging service (MMS) or a long messaging service (LMS).

[0045] The method for delayed transmission of a SMS message according to the present invention can avoid the problems associated with the terminal being turned off or located in a remote region where service is not available. Thus, since a delayed transmission SMS message is managed by the SMSC 200, the SMS message can be reliably transmitted to the recipient at the specified transmission time.

[0046] As the present invention may be embodied in several forms without departing from the essential characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed within its scope as defined in the appended claims.

Claims

1. A method for delayed transmission of a message from a mobile terminal (204) to a recipient over a mobile communication network (210), the method comprising:

composing a message content (S110), wherein the message content is stored in a storage medium of the mobile terminal (204); and

transmitting (S150) transmission information and the message content to a remote message center (200) over the mobile communication network (210), wherein the message content is stored (S230) in a storage medium (202) of the message center (200) for delayed transmission to the recipient in accordance with timing information included in the transmission information;

characterizing by

encapsulating the transmission information and the message content into a user data header, hereinafter called UDH, of a short messaging service message, hereinafter called SMS message, wherein the encapsulation of the transmission information and the message content is represented by setting a parameter in a transfer protocol data unit, hereinafter called TPDU, utilized for transmitting a SMS message, wherein the parameter is a transfer protocol user data header indicator, hereinafter called TP-UDHI, of the TPDU.

2. The method of claim 1, wherein the message content is transmitted from the message center (200) to the recipient (205) after a predefined time specified by the timing information expires.

3. The method of claim 1, wherein an information element identifier field, hereinafter called IEI field of the TPDU comprises the timing information.

4. The method of claim 1, wherein a compressed short message field of the TPDU comprises the message content in compressed form.

5. The method of claim 1, wherein an information element identifier data length field, hereinafter called IEIDL field of the TPDU comprises information about length of the transmission information.

6. The method of claim 1, wherein the timing information comprises at least one of a relative transmission time and an absolute transmission time, wherein the relative transmission time indicates a time delay after which the message content is to be transmitted from the remote message center (200) to the recipient (205), and the absolute transmission time indicates a specific time at which the message content is to be transmitted from the remote message center (200) to the recipient (203).

7. The method of claim 6, wherein the transmission information further comprises an identifier, wherein a first value of the identifier indicates that the timing information represents the absolute transmission time, and a second value of the identifier indicates that the timing information represents the relative transmission time.

8. The method of claim 1, further comprising associating transmission information with the message content, wherein the transmission information comprises timing information for transmitting the message content to a recipient (205) with a delay.

9. A system for delayed transmission of a message from a mobile terminal (204) to a recipient (205) over a mobile

communication network, the system comprising:

a receiver configured to receive a message content and transmission information from the mobile terminal (204) over the mobile communication network (210), wherein the transmission information comprises timing information for transmitting the received message content to the recipient (205); and
a processor configured to store the message content in a storage medium (202) of the system and to transmit the message content according to the timing information **characterized in that**
the mobile terminal (204) is adapted to encapsulate the transmission information and the message content into a user data header, hereinafter called UDH, of a short messaging service message, hereinafter called SMS message, wherein the encapsulation of the transmission information and the message content is represented by a parameter set in a transfer protocol data unit, hereinafter called TPDU, utilized for transmitting a SMS message, wherein the parameter is a transfer protocol user data header indicator hereinafter called TP-UDHI, of the TPDU.

10. The system of claim 9, further including a transmission unit (201) adapted to transmit the stored message content to the recipient (205) after a predefined time specified by the timing information expires.
11. The system of claim 9, wherein an information element identifier field, hereinafter called IEI-field, of the TPDU comprises the timing information.
12. The system of claim 9, wherein a compressed short message field of the TPDU comprises the message content in compressed form.
13. The system of claim 9, wherein an information element identifier data length field, hereinafter called IEIDL-field, of the TPDU comprises information about length of the transmission information.
14. The system of claim 9, wherein the timing information comprises at least one of a relative transmission time and an absolute transmission time, wherein the relative transmission time indicates a time delay after which the message content is to be transmitted from the remote message center (200) to the recipient (205), and the absolute transmission time indicates a specific time at which the message content is to be transmitted from the remote message center (200) to the recipient (205).
15. The system of claim 9, wherein the transmission information further comprises an identifier, wherein a first value of the identifier indicates that the timing information represents the absolute transmission time, and a second value of the identifier indicates that the timing information represents the relative transmission time.

Patentansprüche

1. Verfahren zum verzögerten Übertragen einer Nachricht von einem Mobilendgerät (204) zu einem Empfänger über ein Mobilkommunikationsnetz (210), wobei das Verfahren umfasst:

Zusammensetzen (S110) eines Nachrichteninhalts, wobei der Nachrichteninhalt in einem Speichermedium des Mobilendgeräts (204) gespeichert wird; und
Übertragen (S150) von Übertragungsinformationen und des Nachrichteninhalts zu einem entfernten Nachrichtenzentrum (200) über das Mobilkommunikationsnetz (210), wobei der Nachrichteninhalt in einem Speichermedium (202) des Nachrichtenzentrums (200) gespeichert wird (S230), um ihn in Übereinstimmung mit in den Übertragungsinformationen enthaltenen Zeitverlaufsinformationen an den Empfänger verzögert zu übertragen;

gekennzeichnet durch

Einkapseln der Übertragungsinformationen und des Nachrichteninhalts in einen im Folgenden UDH genannten Anwenderdatenkopfsatz einer Kurznachrichtendienst-Nachricht, die im Folgenden SMS-Nachricht genannt wird, wobei die Einkapselung der Übertragungsinformationen und des Nachrichteninhalts durch Setzen eines Parameters in einer Übertragungsprotokoll-Dateneinheit, die im Folgenden TPDU genannt wird und zum Übertragen einer SMS-Nachricht verwendet wird, repräsentiert wird, wobei der Parameter ein im Folgenden TP-UDHI genannter Übertragungsprotokoll-Anwenderdaten-Kopfsatzindikator der TPDU ist.

2. Verfahren nach Anspruch 1, wobei der Nachrichteninhalt von dem Nachrichtenzentrum (200) an den Empfänger

(205) übertragen wird, nachdem eine durch die Zeitverlaufsinformationen spezifizierte im Voraus definierte Zeit abgelaufen ist.

3. Verfahren nach Anspruch 1, wobei ein im Folgenden IEI-Feld genanntes Informationselementidentifizierer-Feld der TPDU die Zeitverlaufsinformationen enthält.

4. Verfahren nach Anspruch 1, wobei ein komprimiertes Kurznachrichtenfeld der TPDU den Nachrichteninhalt in komprimierter Form enthält.

5. Verfahren nach Anspruch 1, wobei ein im Folgenden IEIDL-Feld genanntes Informationselementidentifizierer-Datenlängen-Feld der TPDU Informationen bezüglich der Länge der Übertragungsinformationen enthält.

6. Verfahren nach Anspruch 1, wobei die Zeitverlaufsinformationen wenigstens eine relative Übertragungszeit und eine absolute Übertragungszeit umfassen, wobei die relative Übertragungszeit eine Zeitverzögerung, nach der der Nachrichteninhalt von dem entfernten Nachrichtenzentrum (200) zu dem Empfänger (205) übertragen werden soll, angibt und die absolute Übertragungszeit eine spezifizierte Zeit angibt, zu der der Nachrichteninhalt von dem entfernten Nachrichtenzentrum (200) zu dem Empfänger (203) übertragen werden soll.

7. Verfahren nach Anspruch 6, wobei die Übertragungsinformationen ferner einen Identifizierer enthalten, wobei ein erster Wert des Identifizierers angibt, dass die Zeitverlaufsinformationen die absolute Übertragungszeit repräsentieren, und ein zweiter Wert des Identifizierers angibt, dass die Zeitverlaufsinformationen die relative Übertragungszeit repräsentieren.

8. Verfahren nach Anspruch 1, das ferner das Zuordnen von Übertragungsinformationen zu dem Nachrichteninhalt umfasst, wobei die Übertragungsinformationen die Zeitverlaufsinformationen zum Übertragen des Nachrichteninhalts an einen Empfänger (205) mit einer Verzögerung umfassen.

9. System zum verzögerten Übertragen einer Nachricht von einem Mobilendgerät (204) zu einem Empfänger (205) über ein Mobilkommunikationsnetz, wobei das System umfasst:

einen Empfänger, der konfiguriert ist, um einen Nachrichteninhalt und Übertragungsinformationen von dem Mobilendgerät (204) über das Mobilkommunikationsnetz (210) zu empfangen, wobei die Übertragungsinformationen Zeitverlaufsinformationen zum Übertragen des empfangenen Nachrichteninhalts an den Empfänger (205) enthalten; und

einen Prozessor, der konfiguriert ist, um den Nachrichteninhalt in einem Speichermedium (202) des Systems zu speichern und um den Nachrichteninhalt in Übereinstimmung mit den Zeitverlaufsinformationen zu übertragen,

dadurch gekennzeichnet, dass

das Mobilendgerät (204) dazu ausgelegt ist, die Übertragungsinformationen und den Nachrichteninhalt in einen im Folgenden UDH genannten Anwenderdatenkopfsatz einer Kurznachrichtendienst-Nachricht, die im Folgenden SMS-Nachricht genannt wird, einzukapseln, wobei die Einkapselung der Übertragungsinformationen und des Nachrichteninhalts durch einen Parameter repräsentiert wird, der in einer Übertragungsprotokoll-Dateneinheit, die im Folgenden TPDU genannt wird und für die Übertragung einer SMS-Nachricht verwendet wird, gesetzt wird, wobei der Parameter ein im Folgenden TP-UDHI genannter Übertragungsprotokoll-Anwenderdaten-Kopfsatzindikator der TPDU ist.

10. System nach Anspruch 9, das ferner eine Übertragungseinheit (201) umfasst, die dazu ausgelegt ist, den gespeicherten Nachrichteninhalt zu dem Empfänger (205) zu übertragen, nachdem eine durch die Zeitverlaufsinformationen spezifizierte im Voraus definierte Zeit abgelaufen ist.

11. System nach Anspruch 9, wobei ein im Folgenden IEI-Feld genanntes Informationselementidentifizierer-Feld der TPDU die Zeitverlaufsinformationen enthält.

12. System nach Anspruch 9, wobei ein komprimiertes Kurznachrichtenfeld der TPDU den Nachrichteninhalt in komprimierter Form enthält.

13. System nach Anspruch 9, wobei ein im Folgenden IEIDL-Feld genanntes Informationselementidentifizierer-Daten-

längen-Feld der TPDU Informationen über die Länge der Übertragungsinformationen enthält.

14. System nach Anspruch 9, wobei die Zeitverlaufsinformationen eine relative Übertragungszeit und/oder eine absolute Übertragungszeit umfassen, wobei die relative Übertragungszeit eine Zeitverzögerung angibt, nach der der Nachrichteninhalt von dem entfernten Nachrichtenzentrum (200) zu dem Empfänger (205) übertragen werden soll, und die absolute Übertragungszeit eine spezifizierte Zeit angibt, zu der der Nachrichteninhalt von dem entfernten Nachrichtenzentrum (200) zu dem Empfänger (205) übertragen werden soll.

15. System nach Anspruch 9, wobei die Übertragungsinformationen ferner einen Identifizierer enthalten, wobei ein erster Wert des Identifizierers angibt, dass die Zeitverlaufsinformationen die absolute Übertragungszeit repräsentieren, und ein zweiter Wert des Identifizierers angibt, dass die Zeitverlaufsinformationen die relative Übertragungszeit repräsentieren.

Revendications

1. Procédé pour la transmission retardée d'un message à partir d'un terminal mobile (204) vers un destinataire sur un réseau de communication mobile (210), le procédé comprenant :

la composition d'un contenu de message (S 110), dans lequel le contenu de message est stocké dans un support de stockage du terminal mobile (204) ; et
l'émission (S150) des informations de transmission et du contenu de message vers un centre de messagerie éloigné (200) sur le réseau de communication mobile (210), dans lequel le contenu de message est stocké (S230) dans un support de stockage (202) du centre de messagerie (200) pour émission retardée vers le destinataire en fonction des informations de temporisation qui font partie des informations de transmission ;

caractérisé par

l'encapsulation des informations de transmission et du contenu de message dans un en-tête de données d'utilisateur (User Data Header en anglais), appelé par la suite UDH, d'un message de service de messagerie court (Short Messaging Service en anglais), appelé par la suite message SMS, dans lequel l'encapsulation des informations de transmission et du contenu de message est représentée par le réglage de la valeur d'un paramètre dans une unité de données de protocole de transfert (transfer protocol data unit en anglais), appelée par la suite TPDU, utilisée pour la transmission de messages SMS, dans lequel le paramètre est un indicateur d'en-tête de données d'utilisateur de protocole de transfert (transfer protocol user data header indicator en anglais), appelé par la suite TP-UDHI, de l'unité de données de protocole de transfert TPDU.

2. Le procédé selon la revendication 1, dans lequel le contenu de message est transmis à partir du centre de messagerie (200) vers le destinataire (205) à la fin d'une durée prédéfinie spécifiée par les informations de temporisation.

3. Le procédé selon la revendication 1, dans lequel un champ d'identification d'élément d'informations (information element identifier field en anglais), appelé par la suite champ IEI de l'unité de données de protocole de transfert TPDU comprend les informations de temporisation.

4. Le procédé selon la revendication 1, dans lequel un champ de message court compressé du TPDU comprend le contenu du message sous une forme compressée.

5. Le procédé selon la revendication 1, dans lequel un champ de longueur de données d'identificateur d'élément d'informations (information element identifier data length en anglais), appelé par la suite champ IEIDL, du TPDU comprend des informations concernant la longueur des informations de transmission.

6. Le procédé selon la revendication 1, dans lequel les informations de temporisation comprennent au moins l'un parmi un temps d'émission relatif et un temps d'émission absolu, dans lequel le temps d'émission relatif indique une temporisation à la fin de laquelle le contenu de message est à transmettre à partir du centre de messagerie éloigné (200) vers le destinataire (205), et le temps d'émission absolu indique un temps spécifique auquel le contenu de message est à transmettre à partir du centre de messagerie éloigné (200) vers le destinataire (203).

7. Le procédé selon la revendication 6, dans lequel les informations de transmission comprennent en outre un identificateur, dans lequel une première valeur de l'identificateur indique le fait que les informations de temporisation

représentent le temps d'émission absolu, et une deuxième valeur de l'identificateur indique le fait que les informations de temporisation représentent le temps d'émission relatif.

8. Le procédé selon la revendication 1, comprenant en outre l'association des informations de transmission avec le contenu de message, dans lequel les informations de transmission comprennent des informations de temporisation pour l'émission du contenu de message vers un destinataire (205) avec un retard.

9. Un système pour la transmission retardée d'un message à partir d'un terminal mobile (204) vers un destinataire (205) sur un réseau de communication mobile, le système comprenant :

un récepteur configuré pour recevoir un contenu de message et des informations de transmission à partir du terminal mobile (204) sur le réseau de communication mobile (210), dans lequel les informations de transmission comprennent des informations de temporisation pour la transmission du contenu de message reçu vers le destinataire (205) ; et

un processeur configuré pour stocker le contenu de message dans un support de stockage (202) du système et pour transmettre le contenu de message en fonction des informations de temporisation, **caractérisé en ce que** le terminal mobile (204) est adapté pour encapsuler les informations de transmission et le contenu de message dans un en-tête de données d'utilisateur (user data header en anglais), appelé par la suite UDH, d'un message du service de messages courts, appelé par la suite message SMS, dans lequel l'encapsulation des informations de transmission et du contenu de message est représentée par un paramètre positionné dans une unité de données de protocole de transfert, appelée par la suite TPDU, utilisée pour la transmission d'un message SMS, dans lequel le paramètre est un indicateur d'en-tête de données d'utilisateur de protocole de transfert, appelé par la suite TP-UDHI, du TPDU.

10. Le système selon la revendication 9, comprenant en outre une unité de transmission (201) adaptée pour transmettre le contenu de message stocké au destinataire (205) à la fin d'une durée prédéfinie spécifiée par les informations de temporisation.

11. Le système selon la revendication 9, dans lequel un champ d'identification d'élément d'informations, appelé par la suite champ IEI du TPDU comprend les informations de temporisation.

12. Le système selon la revendication 9, dans lequel un champ de message court compressé du TPDU comprend le contenu de message sous une forme compressée.

13. Le système selon la revendication 9, dans lequel un champ de longueur de données d'identification de l'élément d'informations, appelé par la suite champ IEIDL, du TPDU comprend des informations concernant la longueur des informations de transmission.

14. Le système selon la revendication 9, dans lequel les informations de temporisation comprennent au moins l'un parmi un temps d'émission relatif et un temps d'émission absolu, dans lequel le temps d'émission relatif indique une temporisation à la fin de laquelle le contenu de message est à transmettre du centre de messagerie éloigné (200) au destinataire (205), et le temps d'émission absolu indique un temps spécifique auquel le contenu de message est à transmettre du centre de messagerie éloigné (200) au destinataire (205).

15. Le système selon la revendication 9, dans lequel les informations de transmission comprennent en outre un identificateur, dans lequel une première valeur de l'identificateur indique que les informations de temporisation représentent le temps d'émission absolu, et une deuxième valeur de l'identificateur indique que les informations de temporisation représentent le temps d'émission relatif.

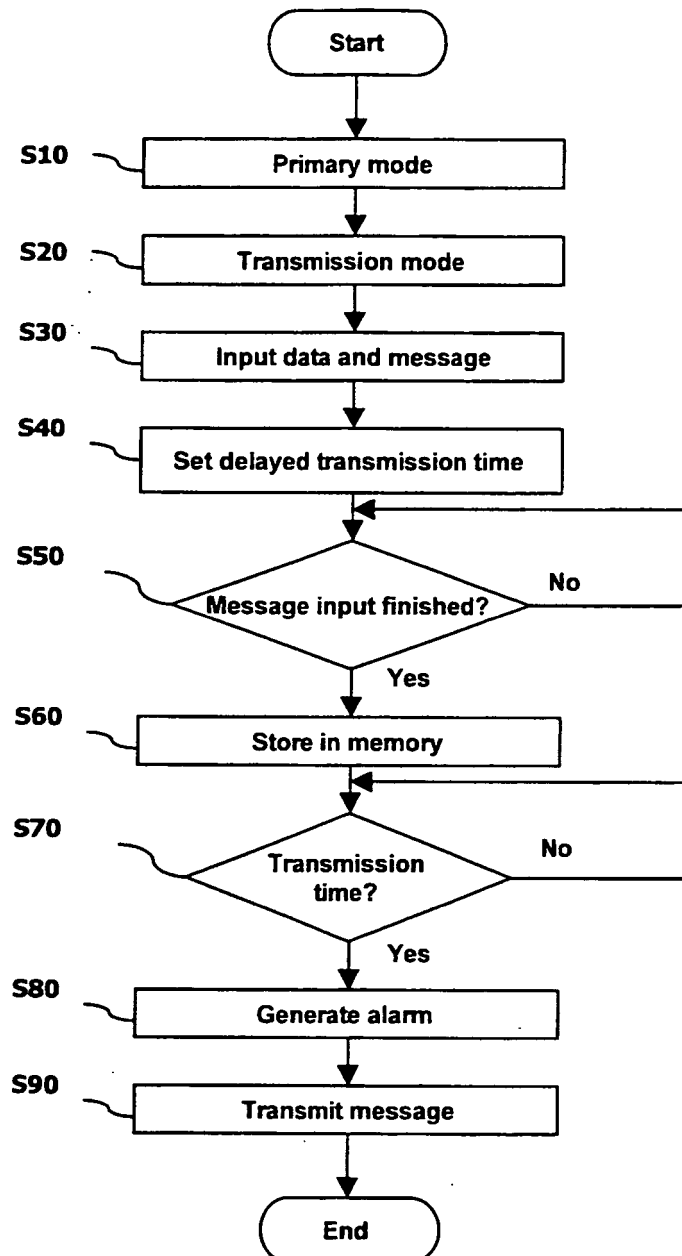
FIG.1

FIG.2

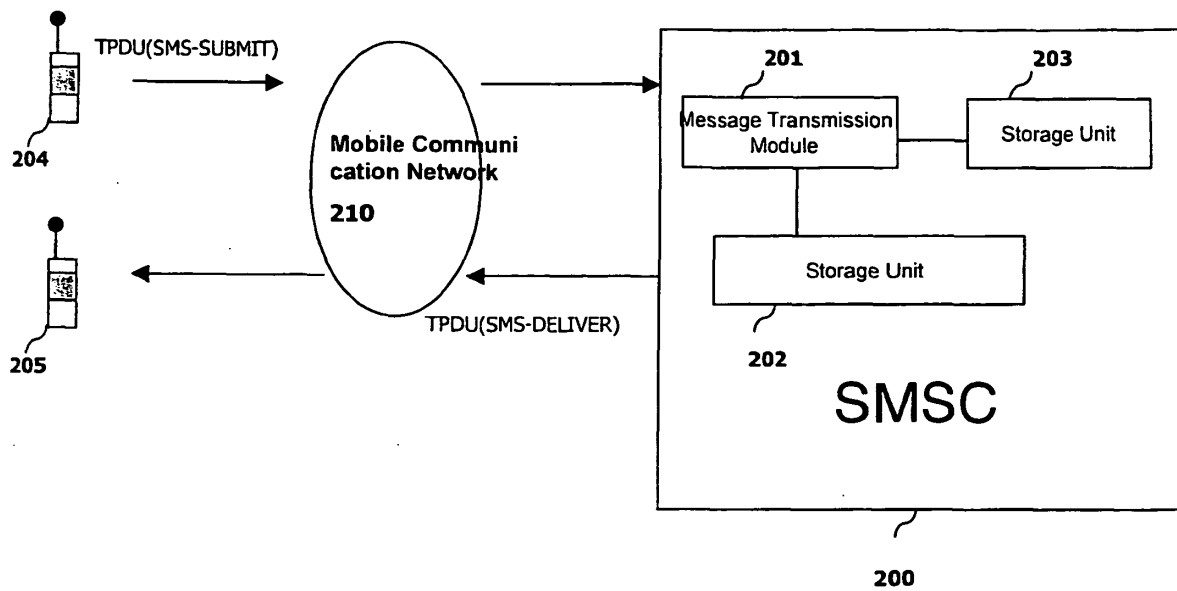
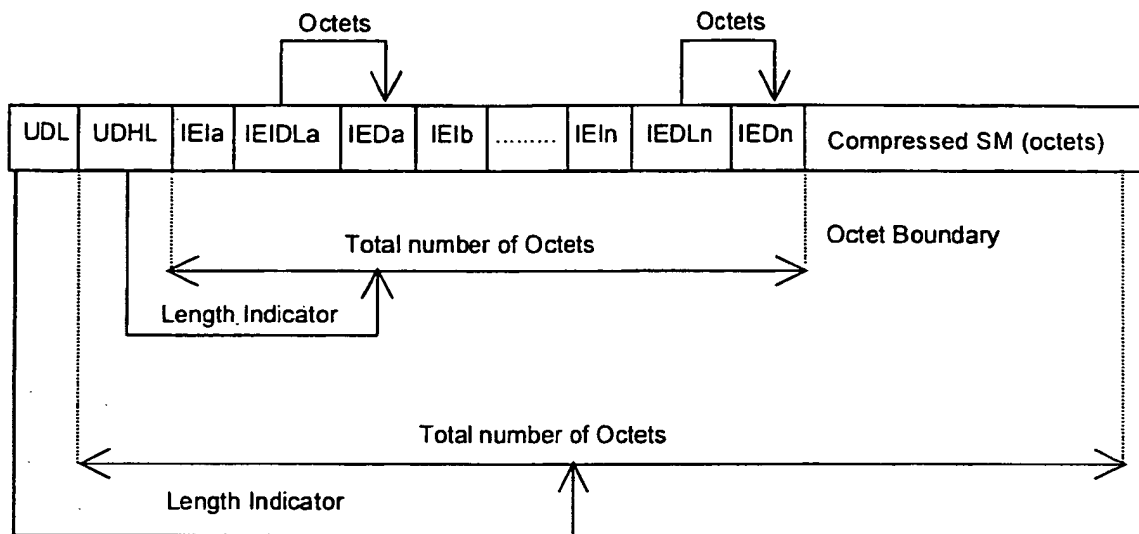


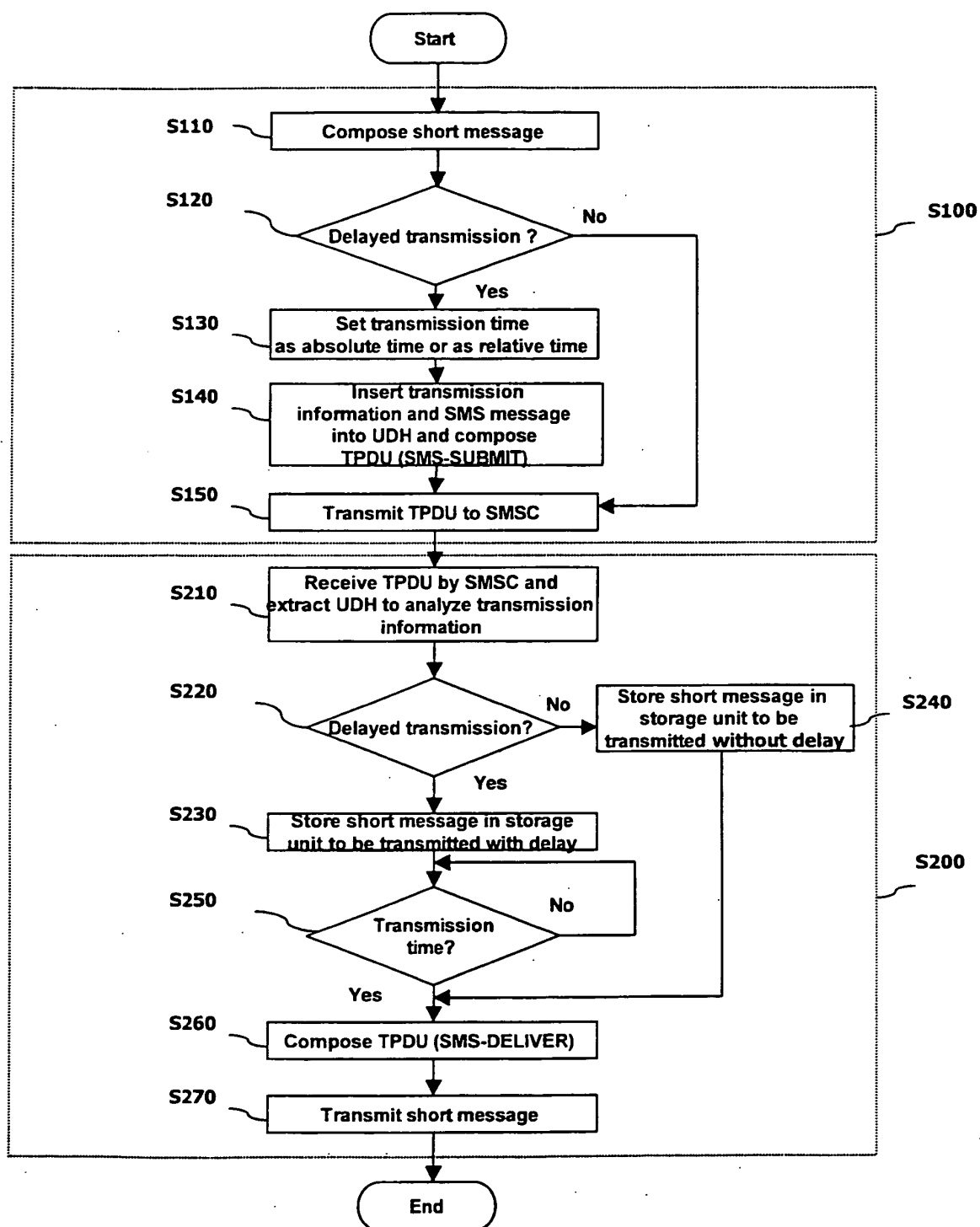
FIG.3

b7		b6		b5		b4		b3		b2		b1		b0		
TP-RP		TP-UDHI		TP-SRR		TP-VPF				TP-RD		TP-MTI				1 Octect
TP-MR																1 Octect
TP-DA																2~12 Octects
TP-PID																1 Octect
TP-DCS																1 Octect
TP-VP																1~7 Octects
TP-UDL																1 Octect
TP-UD																dependent on DCS

FIG.4

UDL	User Data Length
UDHL	User Data Header Length
IEI	Information Element Identifier
IEIDL	Information Element Identifier Data Length
IED	Information Element Data
Compressed SM	Compressed Short Message

FIG.5



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- AU 753358 B2 [0008]
- AU 732382 B2 [0009]